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10/673,612	09/29/2003	Steve Zhihua Zeng	1459-VIXS063	2553

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EXAMINER	
KIM, CHONG R	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/673,612	ZENG, STEVE ZHIHUA	
	Examiner	Art Unit	
	CHARLES KIM	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,13 and 15-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,13 and 15-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on February 28, 2008 has been entered and made of record.

2. Applicant's arguments with respect to the rejected claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-8, 10, 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Maeda et al., U.S. Patent No. 5,606,630 (hereinafter Maeda), Mita et al., U.S. Patent No. 5,231,677 (hereinafter Mita), and Fuji et al., U.S. Patent Application Publication No. 2002/0114015 (hereinafter Fuji).

Referring to claims 1 and 2, Maeda discloses a method comprising receiving a first, second, and third layer of a video image and performing image processing on each of the individual layers [col. 8, ll. 3-34. Note that Maeda separates the video image signal into three layers, R, G, and B, and performs gradation processing on each of the three layers of video image data. The processing performed on each layer is construed to meet the limitations regarding the claimed first and second video layers]. Maeda does not explicitly disclose that the

processing on each layer comprises determining a first edge layer based on the first layer and blending the first layer with a first other layer, wherein control of the blending is based upon the first edge layer.[1]

Mita discloses processing an image which comprises the steps of determining a first edge layer based on a first image layer and blending the first image layer with a first other layer, wherein control of the blending is based upon the first edge layer [col. 4, ll. 20-col. 6, ll. 54 and figure 1. Note that the blending process is performed in accordance with the detected edge information].

Maeda and Mita are combinable because they are both concerned with performing image processing on image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Maeda such that the image processing performed on each video layer comprises determining a first edge layer and blending the first image layer with a first other layer based on the first edge layer, as taught by Mita. The reason for doing so would have been to produce a high quality and high precision image from an input image signal [Mita, col. 2, ll. 59-65]. Therefore, it would have been obvious to combine Maeda with Mita.

As noted above, Mita explains that the blending process is performed based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises only one of a vertical edge component or a horizontal edge component of the edge layer and hence, does not disclose that the blending process is performed based on only one of a vertical edge component or a horizontal edge component of the edge layer.

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[1] The Examiner notes that the video image in Maeda is merely an image, i.e., a two dimensional composition of

Fuji discloses detecting edge information that comprises only horizontal or only vertical components [p. 12, par. 190].

The Examiner notes that Mita's teaching of performing the blending process based on detecting edge information in the edge layer, combined with Fuji's teaching of detecting edge information for only the vertical or only the horizontal edge components, teaches and suggests a blending process that is based upon only one of a vertical edge component or a horizontal edge component of the edge layer.

Maeda, Mita, and Fuji are combinable because they are all concerned with image processing methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Mita's edge detection process so that only the vertical or only the horizontal edge components are detected, as taught by Fuji. The reason for doing so would have been to enhance the computational efficiency of the edge detection process by reducing, by half, the amount of edges required to be detected in the image. Therefore, it would have been obvious to combine Maeda and Mita with Fuji to obtain the invention as specified in claims 1 and 2.

Referring to claim 3, Maeda further discloses providing a composite of the first video layer and the second video layer for display on a display device (col. 8, ll. 35-46. Note that the RGB layers are combined into a composite image.).

Referring to claim 4, Mita further discloses that the first other layer is a filtered representation of the first image layer (Figure 1, item c).

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image pixels.

Referring to claim 5, Mita further discloses that the filtered representation is a smoothed representation of the first video layer (Figure 1, item c).

Referring to claims 6-7, Maeda further discloses that the first video layers is one of an RGB layer or a YUV layer (col. 8, ll. 26-46).

Referring to claim 8, Mita discloses that the blending process is performed based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises the horizontal edge component independent of the vertical edge component and hence, does not disclose that the blending is based upon the horizontal edge component independent of the vertical edge component.

As noted above, Fuji discloses detecting edge information that comprises only the horizontal edge component, independent of the vertical edge component [see par. 190]. Accordingly, the combination of Mita and Fuji disclose blending that is based upon the horizontal edge component independent of the vertical edge component.

Referring to claim 10, Mita discloses that the blending process is performed based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises the vertical edge component independent of the horizontal edge component and hence, does not disclose that the blending is based upon the vertical edge component independent of the horizontal edge component.

As noted above, Fuji discloses detecting edge information that comprises only the vertical edge component, independent of the horizontal edge component [see par. 190]. Accordingly, the combination of Mita and Fuji disclose blending that is based upon the vertical edge component independent of the horizontal edge component.

Referring to claim 18, Maeda discloses a method comprising receiving a first, second, and third layer of a video image and performing image processing on each of the individual layers [col. 8, ll. 3-34. Note that Maeda separates the video image signal into three layers, R, G, and B, and performs gradation processing on each of the three layers of video image data]. Maeda does not explicitly disclose that the processing on each layer comprises determining an edge layer based upon an image layer; determining a filtered layer based upon the image layer; determining a blending ratio for each pixel of a blended image layer, wherein the blending ratio is to control blending the image layer and the filtered layer to form the blended image layer, and the blending ration is based on the edge layer.

Mita discloses processing an image which comprises the steps of determining an edge layer based upon an image layer (Figure 1); determining a filtered layer based upon the image layer (Figure 1); determining a blending ratio for each pixel of a blended image layer, wherein the blending ratio is to control blending the image layer and the filtered layer to form the blended image layer, and the blending ratio is based on the edge layer (Figure 1, col. 6, lines 33 – 54. Note that the blending process includes determining a blending ratio, i.e., determining the degree of each image that is to be blended. Moreover, the blending process is determined in accordance with the detected edge information.).

Maeda and Mita are combinable because they are both concerned with performing image processing on image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Maeda such that the image processing performed on each video layer comprises the steps taught by Mita. The reason for doing so would have been to

produce a high quality and high precision image from an input image signal [Mita, col. 2, ll. 59-65]. Therefore, it would have been obvious to combine Maeda with Mita.

As noted above, Mita explains that the blending process, which includes determining the blending ratio, is performed based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises only one of a vertical edge component or a horizontal edge component of the edge layer and hence, does not disclose that the blending ratio is based on only one of a vertical edge component or a horizontal edge component of the edge layer.

Fuji discloses detecting edge information that comprises only horizontal or only vertical components [p. 12, par. 190].

The Examiner notes that Mita's teaching of performing the blending process, which includes determining a blending ratio, based on detecting edge information in the edge layer, combined with Fuji's teaching of detecting edge information for only the vertical or only the horizontal edge components, teaches and suggests providing a blending ratio that is based upon only one of a vertical edge component or a horizontal edge component of the edge layer.

Maeda, Mita, and Fuji are combinable because they are all concerned with image processing methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Mita's edge detection process so that only the vertical or only the horizontal edge components are detected, as taught by Fuji. The reason for doing so would have been to enhance the computational efficiency of the edge detection process by reducing, by half, the amount of edges required to be detected in the image. Therefore, it would have been obvious to combine Maeda and Mita with Fuji to obtain the invention as specified in claim 18.

Referring to claim 19, Mita further discloses that the filtered layer represents a smoothed image (Figure 1, item c).

Referring to claim 20, Maeda discloses a system for receiving a first, second, and third layer of a video image and performing image processing on each of the individual layers [col. 8, ll. 3-34. Note that Maeda separates the video image signal into three layers, R, G, and B, and performs gradation processing on each of the three layers of video image data]. Maeda's system does not include the components for performing the image processing on the video layers, as recited in claim 20. However, these components and steps were well known in the art. For example, Mita discloses a noise filter coupled to receive a source image and to provide a smoothed image (Figure 1); an edge detector coupled to receive the source image and to provide an edge layer (Figure 1); a blending controller coupled to receive the smoothed image and the edge layer and to provide a destination layer based upon the source layer and the destination layer and on the detected edges of the edge layer (Figure 1, col. 6, lines 33 – 54. Note that the destination layer is provided in accordance with the detected edges in the edge layer.).

Maeda and Mita are combinable because they are both concerned with performing image processing on image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Maeda's system to include the teachings of Mita. The reason for doing so would have been to produce a high quality and high precision image from an input image signal [Mita, col. 2, ll. 59-65]. Therefore, it would have been obvious to combine Maeda with Mita.

As noted above, Mita explains that the destination layer is provided based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected

edge information comprises only one of a vertical edge component or a horizontal edge component of the edge layer and hence, does not disclose that the destination layer is provided based on only one of a vertical edge component or a horizontal edge component of the edge layer.

Fuji discloses detecting edge information that comprises only horizontal or only vertical components [p. 12, par. 190].

The Examiner notes that Mita's teaching of providing a destination layer based on detecting edge information in the edge layer, combined with Fuji's teaching of detecting edge information for only the vertical or only the horizontal edge components, teaches and suggests providing a destination layer based upon only one of a vertical edge component or a horizontal edge component of the edge layer.

Maeda, Mita, and Fuji are combinable because they are all concerned with image processing methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Mita's edge detection process so that only the vertical or only the horizontal edge components are detected, as taught by Fuji. The reason for doing so would have been to enhance the computational efficiency of the edge detection process by reducing, by half, the amount of edges required to be detected in the image. Therefore, it would have been obvious to combine Maeda and Mita with Fuji to obtain the invention as specified in claim 20.

Referring to claim 21, Mita discloses that the blending controller provides the destination layer based on detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises the vertical edge component independent

of the horizontal edge component and hence, does not disclose that the destination layer is provide based on the vertical edge component independent of the horizontal edge component.

As noted above, Fuji discloses detecting edge information that comprises only the vertical edge component, independent of the horizontal edge component [see par. 190]. Accordingly, the combination of Mita and Fuji disclose providing a destination layer that is based on the vertical edge component independent of the horizontal edge component.

Referring to claim 22, Mita discloses that the blending controller provides the destination layer based on detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises the horizontal edge component independent of the vertical edge component and hence, does not disclose that the destination layer is provided based on the horizontal edge component independent of the vertical edge component.

As noted above, Fuji discloses detecting edge information that comprises only the horizontal edge component, independent of the vertical edge component [see par. 190]. Accordingly, the combination of Mita and Fuji disclose providing a destination layer that is based on the horizontal edge component independent of the vertical edge component.

Referring to claim 23, Mita discloses that the blending process, which includes determining the blending ratio, is performed based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises the vertical edge component independent of the horizontal edge component and hence, does not disclose that the blending ratio is based on the vertical edge component independent of the horizontal edge component.

As noted above, Fuji discloses detecting edge information that comprises only the vertical edge component, independent of the horizontal edge component [see par. 190]. Accordingly, the combination of Mita and Fuji disclose providing a blending ratio that is based on the vertical edge component independent of the horizontal edge component.

Referring to claim 24, Mita discloses that the blending process, which includes determining the blending ratio, is performed based on the detected edge information in the edge layer. However, Mita does not explicitly disclose that the detected edge information comprises the horizontal edge component independent of the vertical edge component and hence, does not disclose that the blending ratio is based on the horizontal edge component independent of the vertical edge component.

As noted above, Fuji discloses detecting edge information that comprises only the horizontal edge component, independent of the vertical edge component [see par. 190]. Accordingly, the combination of Mita and Fuji disclose providing a blending ratio that is based on the horizontal edge component independent of the vertical edge component.

4. Claims 13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Maeda, Mita, Fuji, and Hsieh et al., U.S. Patent No. 6,011,558 (hereinafter Hsieh).

Referring to claim 13, Maeda, Mita, and Fuji do not explicitly disclose determining a horizontal gradient for the plurality of pixels of the first video layer. However, this feature was exceedingly well known in the art. For example, Hsieh discloses determining a horizontal gradient for a plurality of pixels in an image [col. 4, ll. 20-31. Hsieh describes the process of

determining vertical gradients and explains that a similar process can be used to determine horizontal gradients].

Maeda, Mita, Fuji, and Hsieh are combinable because they are all concerned with image processing methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Maeda, Mita, and Fuji to determine the horizontal gradient, as taught by Hsieh. The reason for doing so would have been to enhance the edge detection process by using gradient-based edge detection, which was well known for quickly and efficiently detecting edges. Therefore, it would have been obvious to combine Maeda, Mita, and Fuji with Hsieh to obtain the invention as specified in claim 13.

Referring to claim 15, Maeda, Mita, and Fuji do not explicitly disclose determining a vertical gradient for the plurality of pixels of the first video layer. However, this feature was exceedingly well known in the art. For example, Hsieh discloses determining a vertical gradient for a plurality of pixels in an image [col. 4, ll. 20-31].

Maeda, Mita, Fuji, and Hsieh are combinable because they are all concerned with image processing methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Maeda, Mita, and Fuji to determine the vertical gradient, as taught by Hsieh. The reason for doing so would have been to enhance the edge detection process by using gradient-based edge detection, which was well known for quickly and efficiently detecting edges. Therefore, it would have been obvious to combine Maeda, Mita, and Fuji with Hsieh to obtain the invention as specified in claim 15.

5. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Maeda, Mita, Fuji, Hsieh, and Sobel et al., U.S. Patent No. 6,707,937 (hereinafter Sobel).

Referring to claim 16, Hsieh discloses vertical gradients, as noted above. However, Hsieh does not explicitly disclose an edge indicator at a pixel when a vertical gradient at the pixel is greater than a predefined value.

Sobel discloses an edge indicator at a pixel when a gradient at the pixel is greater than a predefined value [col. 10, l. 65-col. 11, l. 16].

Maeda, Mita, Fuji, Hsieh, and Sobel are combinable because they are all concerned with image processing methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Maeda, Mita, Fuji, and Hsieh to include an edge indicator at a pixel when a gradient at the pixel is greater than a predefined value, as taught by Sobel. The reason for doing so would have been to enhance the accuracy of the edge detection process by utilizing a threshold-based gradient edge detection technique, which was well known in the art for accurately detecting edges. Therefore, it would have been obvious to combine Maeda, Mita, Fuji and Hsieh with Sobel to obtain the invention as specified in claim 16.

Referring to claim 17, Sobel further discloses that the predefined value is user definable [col. 10, l. 65-col. 11, l. 16].

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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